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Title: The six-minute walking test in patients with severe COPD: What conditions are matters?

Dr. Maria 17627 Sanzharovskaya Maria.san@mal.ru MD ¹, Dr. Anna 17628 Fisenko fisenko903@yandex.ru MD ¹, Prof. Georgy 17629 Chernogoryuk Chernogoryuk@yandex.ru MD ¹ and Dr. Konstantin 17630 Zavadovskiy konstz@cardio.tsu.ru MD ². ¹ Chair of Hospital Therapy, Siberian State Medical University, Tomsk, Russian Federation, 634034 and ² Department of Nuclear Medicine of Cardiology, Siberian Branch of the Russian Academy of Medical Sciences, Tomsk, Russian Federation .

Body: The distance walked during a Six-Minute Walk Test (6 MWD) is used for following the natural history of COPD, for assessing the response to therapeutic interventions, to estimate the prognosis in BODE index, in cardiology it is used to estimation of the chronic heart failure. Normally patients with COPD III and IV stage are patients with polypatology. Aim: to investigate the pathologic conditions which influence on the 6 MWD in severe COPD patents with and without exacerbation. Methods: 120 patients were clinically and functionally investigated in the study during and after hospitalization in the pulmonology department. Additionally for 16 patients was performed gated blood pool single photon emission computer tomography (gbSPECT) and proBNP measurement. Results:

	6 MWD during exacerbation (R)	p	6 MWD without exacerbation (R)	p
GOLD stage	-0.21	0.27	-0.128	0.177
VC	0.37	0.000021	0.31	0.00062
FVC	0.38	0.000009	0.33	0.00022
FEV1	0.31	0.000366	0.38	0.045
SaO2	0.36	0.000032	0.39	0.00001
Coronary heart disease	-0.136	0.16	-0.25	0.008
Any heart failure (clinically)	-0.09	0.38	-0.25	0.0097
Muscle dysfunction index	0.33	0.00044	0.48	0.000000
Lean body mass	0.011	0.904	0.036	0.69
Stroke index of Left Ventricle			0.55	0.027
End-systolic volume of Right Ventricle (RV)			0.61	0.0077

End-diastolic index (RV)			0.58	0.013
End-systolic index (RV)			0.62	0.008
Right atrium frontal size			0.65	0.003
proBNP			0.088	0.78

Conclusion: in patients with COPD during disease exacerbation the main 6MWD limiting factors are respiratory function failure, hypoxia and muscle dysfunction. In stable state left and right heart dysfunction even without clinically significant heart failure contribute to 6MWD limitation.